

## ABSTRACT

An apparatus and method for exposing a substrate to plasma radicals including a first reaction chamber adapted to generate a plasma comprising ions and radicals and a second reaction chamber coupled to the first reaction chamber and adapted to house a substrate at a sight in the second reaction chamber. The second reaction chamber is coupled to the first reaction chamber such that the plasma traveling from the first reaction chamber to the second reaction chamber is separated from the substrate location by a distance equivalent to the lifetime of the ions at a given plasma discharge rate. In this manner, radicals reach the substrate and react with the substrate or a material on the substrate while the ions that were initially present in the plasma convert to a charge neutral state.

04298.044